

REMARKS

Applicant has amended claims 1, 6, and 11. The claim language is supported by the as-filed specification, e.g., ¶¶ [0043-0045]. No new matter has been introduced by this amendment.

Claim 1 was rejected under 35 U.S.C. § 112, first paragraph for allegedly failing to comply with enablement requirement. Office Action at page 2. Specifically, the Office Action asserted that the as-filed specification purportedly does not disclose structure, operation, or function of the claimed “rectifier.” Applicant respectfully submits that the structure, operation, and function of the claimed rectifier are disclosed in the specification, e.g., at ¶¶ [0043-0045], and are depicted in Figs. 4-5. In particular, ¶¶ [0043] and [0045] describe operation and function of rectifier portion 217 as rectifying a flow path of a powdery material P, flowing from a swirler portion 216, along an axial line H of a coaxial nozzle 22 so that the powdery material P flows parallel to the axial line H. In addition, ¶ [0044] describes structure of the rectifier portion 217 as comprising a plurality of passages extending between a bottom surface of the swirler portion 216 and a discharge portion 218 in a diametrically-reduced portion, as also depicted in Figs 4 and 5. In view of this disclosure in the specification text and drawings, Applicant respectfully submits that the structure, operation, and function of the claimed rectifier are disclosed in the as-filed specification, and requests withdrawal of the §112, first paragraph rejection of claim 1.

Claim 1 was rejected under 35 U.S.C. § 112, second paragraph for allegedly containing an informality. Office Action at page 2. The Office Action asserted that the claim term “rectifier” is purportedly indefinite. Amended claim 1 now recites the term

“rectifier” in more clear and definite form, i.e., “a rectifier rectifying a flow path of [a] powdery material, configured to direct the powdery material in a direction substantially parallel to [a] central axial line in an equal amount across [a] process part of [a] valve seat portion.” Applicant respectfully requests withdrawal of the §112 second paragraph rejection of claim 1 in view of this amendment.

Applicant respectfully traverses the 35 U.S.C. § 103(a) rejection of claims 1-3, and 6 over JP 10286687 to Kinoshita et al. (“Kinoshita”)¹ in view of DE 19909390 to Nowotny et al. (“Nowotny”); the § 103(a) rejection of claim 4 over Kinoshita in view of Nowotny, and further in view of U.S. Patent No. 6,838,638 to Satou et al. (“Satou”); the §103(a) rejection of claim 5 over Kinoshita in view of Nowotny, and further in view of JP 2891378 to Mihashi (“Mihashi”); the § 103(a) rejection of claim 7 over Kinoshita in view of Nowotny, and further in view of U.S. Patent No. 6,717,106 to Nagano et al. (“Nagano”); the § 103(a) rejection of claim 8 over Kinoshita in view of Nowotny, and further in view of U.S. Patent Publication No. 2002/0003132 to Scalzotto (“Scalzotto”); the §103(a) rejection of claims 9 and 10 over Kinoshita in view of Nowotny, and further in view of U.S. Patent No. 5,571,430 to Kawasaki et al. (“Kawasaki”); the §103(a) rejection of claim 11 over Kinoshita in view of Nowotny, and further in view of U.S. Patent No. 5,837,960 to Lewis et al. (“Lewis”); and the §103(a) rejection of claim 12 over Kinoshita in view of Nowotny, and further in view of JP 405311385 to Yomo et al. (“Yomo”).

¹ The pending Office Action relies on a machine translation of Kinoshita attached to the Office Action mailed December 30, 2008. Office Action at page 3. Accordingly, this Reply refers to the same machine translation of Kinoshita.

Amended claim 1 recites, among other things, “a rotator rotating [a] laser-processing head around [a] central axial line of [a] valve seat portion such that the laser-processing head is inclined with respect to [a] generally vertical line.” Claim 6 recites, among other things, “holding a laser-processing head in an inclined orientation with respect to [a] vertical direction and rotating the laser-processing head around [a] central axial line of [a] valve seat portion.”

Kinoshita neither discloses nor suggests at least the above-mentioned features of amended claims 1 and 6. Kinoshita at ¶¶ [0013, 0025] discloses a rotational driving means rotating a mounting base around a predetermined axis of rotation; and a mounting base positioning mechanism for moving the mounting base continuously and freely in a two-dimensional flat surface, and coinciding an axial center of a valve seat part and the predetermined axis of rotation of the valve seat part while intervening between the mounting base and the rotational driving means. Kinoshita at ¶ [0027] further discloses that a laser beam irradiation equipment is arranged such that an irradiation position and focal position of a laser beam are considered to be immobilized. In view of this disclosure, Kinoshita appears to teach that its laser beam irradiation equipment, which the Examiner cited as purportedly corresponding to a laser processing head recited in amended claim 1, is immobilized. In Kinoshita, a mounting base holding a cylinder head, rotates around a predetermined axis of rotation in order to precisely position a valve seat for laser clad processing. Kinoshita therefore does not disclose or suggest at least “a rotator rotating [a] laser-processing head around [a] central axial line of [a] valve seat portion such that the laser-processing head is inclined with respect to [a] generally vertical line,” as recited in amended claim 1, or “holding a

laser-processing head in an inclined orientation with respect to [a] vertical direction and rotating the laser-processing head around [a] central axial line of [a] valve seat portion,” as recited in amended claim 6.

Further, if a proposed modification or combination of the prior art would change the principle of operation of the prior art device being modified, then the teachings of the references are insufficient to establish *prima facie* case of obviousness. M.P.E.P. § 2143.01.VI (citing *In re Ratti*, 270 F.2d 810 (CCPA 1959)). If Kinoshita’s laser beam irradiation equipment were to be modified to rotate, it would change the principle of operation in Kinoshita such that the irradiation position and focal position of a laser beam would no longer be immobilized. One of ordinary skill in the art therefore would not have had any legitimate reason to modify Kinoshita to remove its rotational driving means rotating a mounting base and instead use a rotator rotating its laser beam irradiation equipment.

Moreover, one skilled in the art at the time of invention would not have seen in Kinoshita any teaching or suggestion of rotating its laser beam irradiating equipment by a rotator. Absent the use of impermissible hindsight reasoning based on a prior reading of the present application, Kinoshita would not have been used to achieve the claimed laser-clad processing apparatus and method in which a laser processing head is rotated. See M.P.E.P. § 2141; see also *Rockwell Int’l Corp. v. U.S.*, 147 F.3d 1358, 1364 (Fed. Cir. 1998) (“In determining obviousness, the invention must be considered as a whole without the benefit of hindsight”).

Nowotny also neither discloses nor suggests at least “a rotator rotating [a] laser-processing head,” as recited in amended claim 1, or “rotating [a] laser processing head,”

as recited in amended claim 6. The combination of Kinoshita and Nowotny therefore does not overcome the deficiencies of Kinoshita regarding amended claim 1. The suggestion to rotate a laser-processing head around a central axial line of a valve seat portion exists not in the references, but only in the present application. Applicant's own teachings, however, cannot be used as a blueprint to modify the prior art and reject the claims. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 419 (2007). For at least this reasons, no *prima facie* case of obviousness has been established with regard to amended independent claims 1 and 6. Claims 2 and 3 depend from claim 1, and incorporate all of the features of amended claim 1. Claims 2 and 3 therefore are not obvious over Kinoshita in view of Nowotny because of their dependence from amended claim 1.

Moreover, the claimed invention, wherein a laser processing head is rotated around a central axial line of a valve seat portion of a cylinder head, thereby forming a clad layer on a surface of the valve seat shows unexpected beneficial properties not present in Kinoshita, wherein a mounting base holding a cylinder head rotates while a laser beam irradiation equipment is fixed. In order to carry out the laser-clad processing of Kinoshita, a cylinder head is inclined by a predetermined angle so that a surface of a valve-seat of the cylinder head, on which the laser-clad layer is formed, faces upward, and it is necessary to rotate the entire cylinder head while adjusting axial centers of a valve seat (A_{in} and A_{ex}) parallel to an axis of rotating table 5, as disclosed in ¶¶ [0024-0025]. A great deal of equipment, such as a servo motor 4 for rotation and a rotating table 5, is required to smoothly rotate a mounting base holding a cylinder head while firmly positioning and holding the cylinder head,. In addition, because the cylinder head

is rotated, powdery material becomes easily dissipated and sputtered to the surrounding of a clad layer forming surface. As described in Applicant's as-filed specification at ¶¶ [0004-0006], when "a laser beam is fixed but a cylinder head rotates to carry out laser-clad processing . . . a great deal of equipment investment and facility-installation space have been required"; and "dissipated powder material becomes the cause of troubles at movable parts of a processing apparatus." In contrast, in the claimed apparatus, because it is a laser-processing head that rotates around a central axial line of a valve seat while a cylinder head is immobilized, equipment for rotating the cylinder head as taught by Kinoshita might not be required, thereby possibly saving both cost and space. See ¶¶ [0027-0028]. For these additional reasons, amended claims 1 and 6 are not obvious over Kinoshita in view of Nowotny.

Claims 4 and 5 depend from amended claim 1. As discussed above, the combination of Kinoshita and Nowotny does not disclose or suggest at least "a rotator rotating [a] laser-processing head around [a] central axial line of [a] valve seat portion such that the laser-processing head is inclined with respect to [a generally] vertical line," as recited in amended claim 1. Neither Satou nor Mihashi provides any suggestion of the above-mentioned features missing from Kinoshita and Nowotny.

Claims 7-12 depend from amended claim 6. As discussed above, the combination of Kinoshita and Nowotny does not disclose or suggest at least "holding a laser-processing head in an inclined orientation with respect to [a] vertical direction and rotating the laser-processing head around [a] central axial line of [a] valve seat portion," as recited in amended claim 6. None of Nagano, Kawasaki, Lewis, and Yomo provides any suggestion of the above-mentioned features missing from Kinoshita and Nowotny.

The suggestion to include the above-mentioned features of amended claims 1 and 6 is not found in the cited references, but only exists in the present application. Applicant's own teachings, however, cannot be used as a blueprint to modify the prior art and reject the claims, *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 419 (2007). Accordingly, no *prima facie* case of obviousness has been established with regard to claims 4, 5, 7-12 over Kinoshita and Nowotny in view of the cited § 103(a) references.

In light of the foregoing amendments and remarks, Applicant respectfully requests reconsideration of this application, withdrawal of all of the pending rejections, and timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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